

Unit Planning Guide: Grade 6 Unit 5 of 8

Unit Title: Ratio and Proportion	Pacing (Duration of Unit): 5 weeks
Grade: 6	Buffer Day(s):

Transfer Goals

Students will be able to independently use their learning to:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- **Use appropriate tools strategically.**
- **Attend to precision.**
- **Look for and make use of structure.**
- Look for and express regularity in repeated reasoning.

Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)

Standards (Priority Standards in bold):

- 6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*
- 6.RP.2 Understand the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."*¹
- 6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.**
- Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.**
 - Solve unit rate problems, including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then, at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?***
 - Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $\frac{30}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.**
 - Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.**

WIDA for English Language Learners
 Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting
 Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**

In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports.

¹ Expectations for unit rates in this grade are limited to non-complex fractions.

Big Ideas:	Essential Questions:
<ul style="list-style-type: none"> Proportional reasoning is used when describing the thinking that has been applied to the solution of problems that involve multiplicative relationships. A ratio is a number that relates two quantities or measures within a given situation in a multiplicative relationship (in contrast to a difference or additive relationship). The relationships and rules govern whole numbers, govern all rational numbers. Making explicit the types of relationships that exist between two values will minimize confusion between multiplicative and additive situations. Ratios can express comparisons of a part to whole (a/b with $b \neq 0$), for example, the ratio of the number of boys in a class to the number of students in the class. 	<ul style="list-style-type: none"> How does proportional reasoning influence your daily life? How do ratio and rate connect to whole number multiplication and division?

Acquisition (*Mostly assessed through traditional summative assessments)	
<p>Knowledge: Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> That a ratio describes the relationship between two quantities. That a ratio can be written as a unit rate. That rate and ratio reasoning can be used to solve real world problems using tables of equivalent ratios, tape diagrams, double number line diagrams or equations. That ratios can be used for conversions That percents can be described as rate per 100 	<p>Skills: The discrete skills and process students should be able to use independently (<u>Bloom's Level of Learning should be noted in parentheses.</u>)</p> <p><i>Students will be skilled at:</i></p> <ul style="list-style-type: none"> Identifying relationships between quantities (knowledge) Giving examples of a ratio as a comparison of two quantities or measures (evaluation) Explaining part to part, part to whole relationships (analysis) Representing ratios as a fraction or with a colon (knowledge) Distinguishing between part to part, part to whole and whole to whole relationships (analysis) Identifying whole to whole relationships (comparing two different measures) (knowledge) Explaining what whole to whole relationships are (analysis) Identifying and explaining relationships between quantities (whole to whole) (synthesis) Explaining that rate is a comparison of two quantities of different units expressed as a fraction (analysis) Identifying that unit rates as a comparison of a quantity to one whole (common unit rates are cost per item or distance per time) (understanding)

Vocabulary: bar model constant speed double number line diagram equivalent ratios unit rate	plot proportion quadrants rate ratio	Knowledge Questions: <ul style="list-style-type: none"> • What is a ratio? • What is a rate? • How do you use a ratio to describe the relationship between two quantities? • What are the similarities and differences between ratios, rates, and unit rates? • How do you use ratio and rate reasoning to solve real-world and mathematical problems? • How do you determine the percent of a quantity? • How do you solve unit rate problems including those involving unit pricing and constant speed?
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